The development process of mining pollution at the ashio copper mine

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THE DEVELOPMENT PROCESS OF MINING POLLUTION AT THE ASHIO COPPER MINE

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CONTENTS

This paper is being circulated in a pre-publication form to elicit comments from readers and generate dialogue on the subject at this stage of the research.

I. DESTRUCTION OF THE GENGOROZAWA SLAG PILES AND THE FORMATION OF THE ASSOCIATION FOR THE NULLIFICATION OF MORITA VILLAGE POISONINGS

After the defeat in World War II, Japan reconstructed its economy under the guidance of GHQ occupation policies. The policy of the United States at that time was to disassemble the giant family trust monopolies and related large businesses, believed to be responsible for Japan's war time course, and to realize a democratization of the economy in order that war would not start again. Under these policies, the family trusts and related holding companies were disorganized, and the managers of the main corporations were purged. In 1947, antimonopoly laws were established along with legal structures which would limit the concentration of capital. The seven operating companies making up the Furukawa Corporation were also candidates for the application of these new legal codes.[1] However, as a reflection of the politics of the East-West cold war situation, United States policy changed from democratization of the Japanese economy to reconstruction of said economy, as the primary goal. Because of these policy changes, the Furukawa Mining Company Limited and the other six operating units of the Furukawa combine escaped restructuring under the antimonopoly laws. After the war, during the period of economic reconstruction, the Ashio Copper Mine regained some of its former productivity under an economic policy that emphasized copper production as a basic material necessity. However, this trend did not last long, for J. Dodge, the economic advisor to the GHQ, promoted a tightened economic policy that would avoid a stabilization crisis in order that the run-away inflation of the post-war period be slowed. Because of these influences, the productivity of the Ashio Copper Mine declined.

Then in June of 1950, the Korean War broke out, and Japan became a supply base for the United States military. This brought an economic

boom the likes of which Japan had not seen since World War I. Again the Ashio Copper Mine went into high-gear production. The war in Korea became the springboard for the reconstruction of the Japanese economy. From 1950 to 1955, the total amount of money spent in Japan for special procurements for the war amounted to US$1.6 billion (¥576 billion; see table 1). When the national general account for 1950 was settled it stood at ¥633.2 billion with special procurements accounting for the larger portion. In this economic climate, the Ashio Copper Mine not only went into full-scale production, it experienced an expansion of the smelting plant in order to cope with the very high-quality ores that were coming from other mines.[2] Further, there was need for treatment of powdered ores, more economical use of energy, and reductions in sulfurous anhydride. The company started construction of a new smelting hearth in October 1954 and completed the project in February 1956. Table 2 shows Ashio Copper Mine production in the post-war period.

TABLE 1. Special Procurements — June 1950 to June 1955 (unit: 1,000 US$)

a. Contract Amounts

	Materials	Services	Total
First year	229,995	98,927	328,922
Second year	235,851	79,767	315,618
Third year	305,543	186,785	492,328
Fourth year	124,700	170,910	296,610
Fifth year	78,516	107,740	186,256
Total	974,607	644,129	1,618,736

b. Contract Contents

Materials		Services	
1. Arms	148,489	Construction of buildings	107,641
2. Coal	104,384	Auto repairs	83,036
3. Hemp Sacks	33,700	Loading, unloading, and storage	75,923
4. Auto parts	31,105	Telephone and telegraph	71,210
5. Cotton material	29,567	Machinery repair	48,217

Source: Yoshio Ando (ed.), Kindai Nihon Keizaishi Yoran, University of Tokyo Press, 1975, p. 154.

TABLE 2. Ashio Copper Production in the Post-war Period (unit: tons)

Year	Ashio mined copper	Other sources of copper	Total	Percentage of Ashio copper
1946	1,242	1,411	2,653	46.8
1947	2,178	645	2,823	77.2
1948	2,120	2,673	4,793	44.2
1949	1,915	3,103	5,018	38.2
1950	3,225	5,673	8,898	36.2
1951	3,009	6,403	9,412	40.0
1952	3,331	6,309	9,640	34.6
1953	3,603	5,859	9,462	38.1
1954	3,676	5,618	9,294	39.8
1955	3,186	5,285	8,471	37.6
1956	3,234	6,241	9,475	34.1
1957	3,773	8,581	12,354	30.5
1958	3,501	8,194	11,695	29.9
1959	4,505	13,114	17,619	25.6
1960	4,115	14,943	19,058	21.6

Source: A Local History of Ashio, 1978, p. 174.

After the Korean War, copper production increased rapidly on the basis of ores brought in from other mines and imported ores. In this manner, improvements in smelting brought even further development of the Ashio Copper Mine. At the same time, the inherent problems of the mine were exacerbated.

On 30 May 1958, two years after the completion of the new smelting hearth, the Gengorozawa slag pile, being smaller than the 14 other piles at the Ashio Copper Mine, collapsed thereby introducing 2,000 cubic metres of poisoned slag into the Watarase River system. Six thousand hectares of rice fields were adversely affected by this accident. In that year, there was very little rain, and the farmers were afraid that they would lose their wheat harvests. Therefore, when the slag pile collapsed the cause was not excess rain. In fact, the destruction of the Gengorozawa pile was due completely to a lack of company supervisory responsibility. However, the government administration, being very much on the side of the company, reported in a paper to the Water Quality Commission that the collapse of the slag pile was due both to unusually heavy rains as well as inadequate slag

pile maintenance. But the reality of the situation could not be hidden forever. The destruction of the Gengorozawa piles badly damaged wide areas of Morita Village, Yamada-gun, in Gunma Prefecture, which is the entrance to the Machiyaba Irrigation System. (The present name is Morita, Ohta City.) This collapse of the slag pile came just about rice planting time and 20,000 farmers working fields in the lower reaches of the river system were adversely affected by this accident, and once again the farmers voiced opposition to the copper mine.

When Shoichi Onda, president of the Morita Village Farmers' Cooperative Union, evaluated the company's limited compensation for damages, being only the provision of calcium oxide and fertilizer, he realized the great importance of a movement aimed at stopping all poisonings related to copper mining in the area. Up to that time the only thing that the people demanded of the company was monetary compensation, but there was no questioning of responsibility vis-à-vis the activities of the company. Most of the farmers were forced to remain silent in this regard in that they received nominal sums of money from the company. In this instance also, when the slag pile collapsed, the company tried to settle the claims as in the past. This time Onda vigorously rejected the company offers and organized demonstrations at the copper mine with 150 participants from three cities — Kiryu, Ohta, and Tatebayashi — and three gun — Yamada, Nitta, and Ohta. The first protest took place eleven days after the collapse of the Gengorozawa slag piles.

On July 10, Onda formed the Association for Halting Copper Mine Poisoning with its focus of operations in Morita Village, where he lived (Morita Association), and he became president of the association. He then tried to organize the same kinds of associations in other locations. Being a leader in the Farmers' Union, he was supportive of the conservative Liberal Democratic Party, but his thoughts in support of actions against the copper mine were leftist in orientation. He strongly objected when Farmers' Union representatives seemed about to accept the nominal compensatory contributions offered by the company. He stressed the deep responsibility that was to be laid on the company for the grave damage done and appealed for the complete elimination of

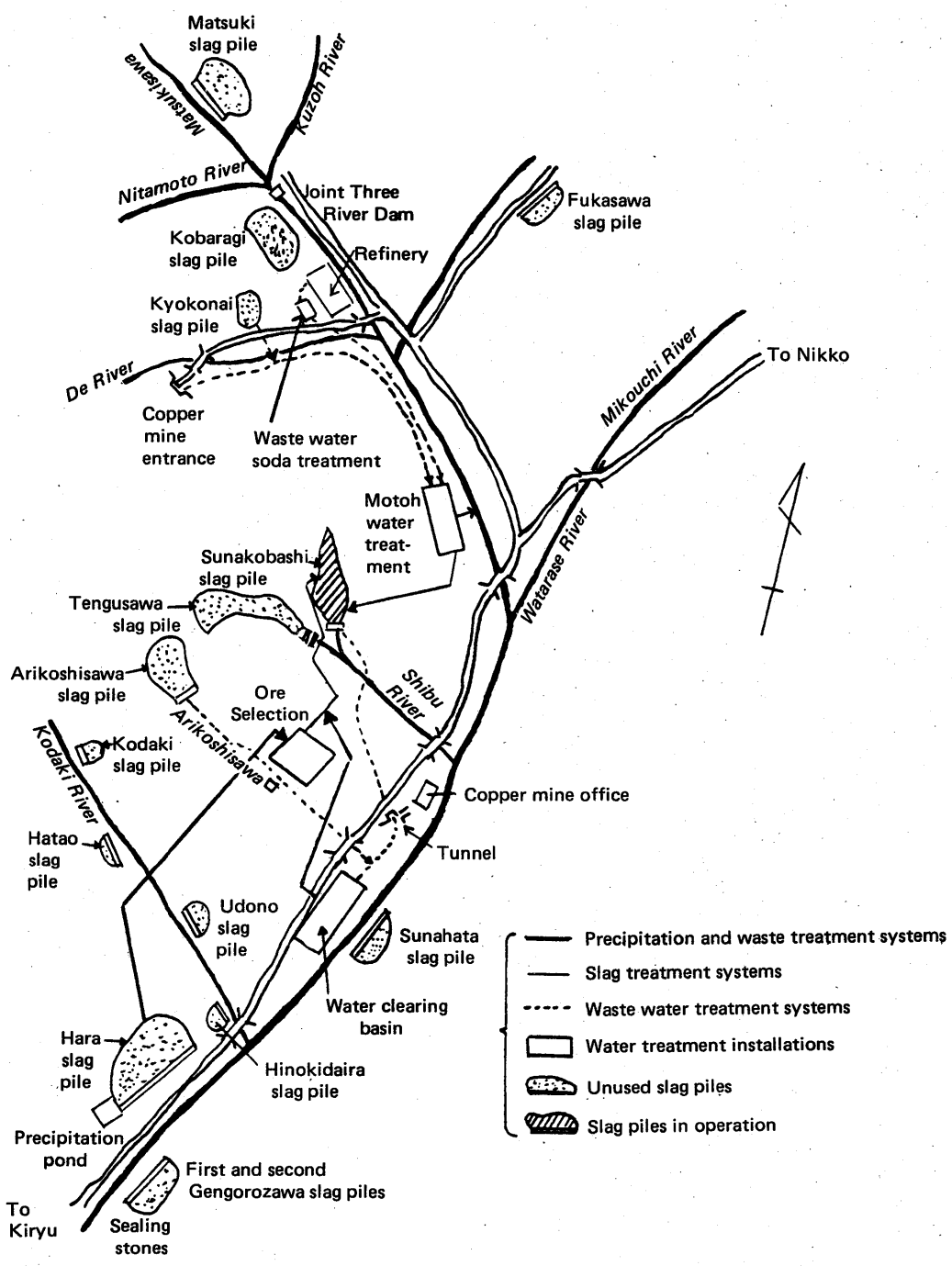

FIG. 1. Map of the Ashio Copper Mining Area (Waste Water Drainage System)

Source: Kankyo Hakai, vol. 5, no. 9, 1974, p. 7.

copper poisons. Moved by Onda's deep determination, other Farmers' Union representatives, who had always thought it impossible to press the company for responsible action, united to demand that the mining company

admit its responsibility for the slag pile incident, that it halt the poisoning, and that it pay compensation for the damage already done. On August 2, Tomoh (Gunma Prefecture) Three-City and Three-District Association for Halting Copper Poisoning in the Watarare River (TCTDA), was formed with Onda as president.

In response to the farmers' protests, the mining company denied all responsibility relative to the collapse of the slag pile citing the fact that there were no government regulations broken. Through this stance it became very clear that the company had no intention of keeping faith with the farmers in the Watarase River basin. However, the company did pay ¥1,753,991 to the national railways in compensation for the destruction of the railroad line. It must be said, however, that this railway line was used only as a link for the transportation of materials to the mine itself. The railway was originally built by the Furukawa Mining Company and was later purchased by the Japan National Railway Public Corporation. This rail line was essential to the operation of the mine. The Furukawa Combine paid a limited compensation to the national railways, simply because the line was essential to the copper mine, but there was no compensation for the farmers who had suffered inestimable damage.

The year 1958, when the Gengorazawa slag pile collapsed, was a momentous year in the history of Japan's environmental pollution. It was not only to be remembered as the one hundredth year of Ashio Copper Mine poisonings, but with the rapid growth of new manufacturing technologies, it was a year in which the lives and fortunes of Japan's farmers and fishermen were to be deeply compromised by rapidly encroaching environmental destruction. During this period, farmers and fishermen took direct action against many different manufacturing companies. Especially, the incident in April of that year, when the Edo River Factory of the Honshu Paper Company dumped wastes into the river, was to ultimately influence government and economic circles very deeply.[3] Because of this very deeply polluting action taken by the company, the Government promulgated two laws designed to regulate water quality and public water systems relative to factory effluents (the Water Quality

Conservation Law, and the Factory Effluents Control Law). The worst cases of pollution during this period were found in rivers and water systems required for paper manufacture. Water pollution was caused in the Ishikari River in Hokkaido by Kokusaku Pulp Company; the Abukuma River in Fukushima Prefecture was polluted by Mitsubishi Paper Company; Takasago City and Kago River in Hyogo Prefecture were polluted by Hyogo Pulp Company; Urado Bay in Kohchi Prefecture was seriously compromised by Nishi Nippon Pulp Company; the Tagonoura area in Fuji City of Shizuoka Prefecture was seriously damaged by the combined paper industries of Daishowa Pulp, Honshu Paper Company, Daiko Paper Company, etc.; all contributing greatly to the destruction of primary fish resources. At the same time Minamata disease caused by the Minamata City factory of the Shin Nippon Chisso Company and "Ouch-Ouch" disease caused by the Kamioka mining operations of the Mitsui Metal Industrial Company were coming to the fore as social problems which were manifested in direct damage to the physical well-being of the people living in those areas. The proper regulation of industrial and mining wastes were becoming problems of national importance. However, the water-quality regulations prepared by the administrative arm of the Government for passage in the National Diet were presented twice for action but each time were opposed by business circles. If there had been no fishermen's demonstration in Urayasu Town (now Urayasu City) in Chiba Prefecture on the occasion of the Honshu Paper Company Edo River pollution incident, the codification of water-quality laws would probably have been very greatly delayed.

The establishment of water-quality laws had been a long-time wish of the victims of the Ashio Copper Mine poisonings. Thus the new water-quality laws established during the year of the Gengorozawa slag pile collapse were most meaningful. These laws were made mandatory on 1 April 1959. In March of the same year, one month before the new laws were promulgated, the Government organized the Water Quality Council under the jurisdiction of the Economic Planning Agency. The role of the council was one of determining which rivers and waterways were most deeply polluted and to determine appropriate water-quality standards for these areas. Although there were no farmers or fishermen on the

council, the presidents of the Furukawa Mining Company and the Kokushu Pulp Company were represented.[4]

TCTDA demanded that representatives of the copper poisoning victims be on the council. In June of that year, 700 farmers went by bus to make their demands, but the Government turned a deaf ear. As a result, the Water Quality Council did not meet for the next two years.

In 1960, public opinion was divided relative to the ratification of the United States — Japan Security Treaty. Although there were massive demonstrations against the treaty by progressive organizations, the ruling Liberal Democratic Party continued with their policy of treaty ratification. At about the same time labour unions confronted the capitalist managers at the Miike Coal Mine operated by Mitsui Mining Company after an explosion at the mine causing carbon monoxide poisonings, but the labour union was completely defeated in its battle for compensation. These two incidents in 1960 provide explanations for certain transformations in Japanese society. The decade of the 1960s was a period in which high economic growth was encouraged, and this intensified pollution problems causing extreme environmental destruction. Although there were two pieces of legislation enacted into law relative to water quality, problems related to the environment worsened greatly because these laws were not applied in specific cases.

In 1962, the Government requested that TCTDA and Morita Association send Onda as a member for the Watarase River Water Quality Committee. Even though it was a special committee, the administrative arm of Government asked that there be poisoning victim representation on the committee as work went forward on water-quality regulation legislation. The government administration appears to have taken a giant leap forward in this case. However, although there was representation on the Council of the companies responsible for damage to the farmers along the Watarase River, the Government demanded that Onda resign as the president of TCTDA and Morita Association. Because of this unfair treatment by the Government, the farmers were angry, but Onda realized the importance of representation in the water-quality legislation

process. He resigned the presidency of the association in December 1962 and became a member of the Watarase River Water Quality Committee.

For Onda, who was committed to the cause of halting copper mine poisonings, the purposes of the committee were not realized. A company representative quit his council membership when Onda criticized him by asking "Does a robber become a judge?" But this voice was replaced by government officials from the Economic Planning Agency and the Ministry of International Trade and Industry.[5]

When rains caused excessive copper poison damage, the committee paid no attention to the Watarase River system. Instead of regulating water quality during the worst period of the year, the commission established water-quality standards by applying yearly averages for copper content. It was a common understanding that the damage done was much greater during the rainy periods and that regulating water quality on the basis of average values had no real meaning. In October 1964, 600 farmers of TCTDA took chartered buses to Tokyo in order to appeal to government officials. Ignoring the efforts of Onda and the numerous appeals and protests of the farmers, the officials of the Economic Planning Agency in collusion with the Ministry of International Trade and Industry and the Ministry of Agriculture and Forestry decided in February 1967 that the standard average copper content of the Watarase River should be 0.06 parts per million (ppm). Onda, who was pressing for a standard of 0.01 ppm copper content, did not know about this government decision. The officials of the Japanese Government came to an agreement with the prefectural officials, completely ignoring the opinions and desires of the farmers who were most directly affected by the decision.

Government officials, through the Gunma prefectural offices, tried to persuade officers of TCTDA and Morita Association to accept this standard for copper content by indicating that expenses would be paid for the improvement of the damaged farmland and that adequate steps would be taken to preclude further copper mine-related environmental destruction. Finally, government officials were able to obtain the

agreement of the farmers for a standard of 0.06 ppm and the legislation was enacted. Onda, who had resigned as president of the associations, did not have the power to change the associations' decision to accept this standard. On 6 March 1968 the Water Quality Council for the Watarase River outvoted Onda's strong objections. Thus the water-quality standard was determined to be 0.06 ppm copper content at Takatsudo in Omama Town, Gunma Prefecture, and 1.5 ppm at the locally known seal rock in Ashio Town, Tochigi Prefecture.[6] On 7 March 1968 the regulation for water quality was announced, but application of the ruling was not to take place until 10 December 1969, a year and ten months after the standard was determined. This delay in application of the ruling was in favour of the mining company, and it took more than ten years for this inadequate ruling of the Water Quality Council to actually take effect.

This backwardness and shortsightedness of the government administration relative to problems of environmental pollution is really what created the explosively controversial environmental destruction of the 1960s and after. When we think of the suffering of Onda, as he was forced to remain silent, we come to realize the difficulties involved and the grave need to solve problems of environmental destruction.

II. POLLUTION PROBLEMS AND ¥1.55 BILLION COMPENSATION

In December 1967, the Watarase River Water Quality Regulation was promulgated. As Onda had insisted, the 0.06 ppm copper content standard was not adequate, and upon examination of the water supply by the Kiryu City Water Bureau, 0.05 ppm of arsenic was discovered in the water — much higher than the national standard for river-based city water supplies. In May and June 1969 the arsenic content was 0.3 ppm, and in October it was 0.5 ppm. This means that the actual arsenic content was six to ten times greater than the national standard. In 1970, similar examinations found that the arsenic content of the water system was four to five times greater than the national standard for more than ten days per month.[7] The purpose of the Watarase River water-quality standard was to control the level of heavy metals other than copper by regulating the copper content. In ignoring the opinions of Onda and other agricultural experts, the Water Quality Committee set standards that were at least six times as lenient, resulting in unexpectedly high concentrations of arsenic in the drinking water.

In 1971 it became painfully apparent that the rice produced in and around Morita Village was badly polluted by cadmium. In June of that year people in the area took health examinations en masse because of the cadmium problem. In the Morita district of Ohta City, the Morita Association elected Meiji Itabashi as president after Onda's resignation. Because of the intense cadmium and arsenic pollution that had been discovered, Itabashi demanded compensation from the Furukawa Copper Mining Company totalling ¥13.2 billion (¥12 million for each of the 1,100 three-generation households). However, in this instance again, the mining company completely ignored the demands. The

Morita Association was forced to compromise with the Government in setting the water-quality standard at 0.06 ppm, well above Onda's demand for a 0.01 ppm standard. This compromise was made on the condition that the Government promote the improvement of the farmland and that public funding be increased. But before any government aid could be brought into the area, the cadmium poisoning problems became well known, and the association of farmers took this problem very seriously. On August 31, Itabashi went to the Environment Agency (this agency was inaugurated on 1 July of the same year) and brought this case to Agency Chief Buichi Ohishi, indicating that the Morita Association had demanded ¥12 billion in compensation from the Furukawa Mining Company for damage to agricultural products over an eight-year period. In the meantime, more and more farming areas were discovered to be severely polluted with cadmium. In January 1972, the Government ordered that rice produced in the Morita area would have to be discarded because of its pollution load. The angry farmers again protested and demanded ¥12 billion compensation for their losses. The mining company ignored the farmers' demands and denied any responsibility for the polluted rice.

At this juncture the Morita Association decided to take this first case to the Central Council for Control of Environmental Pollution for arbitration as to damage to agricultural products between 1952 and 1971.[8] On 31 March, a case was presented for compensation of ¥470,030,000 for 110 people. On 4 May, in accordance with clause 26 of the Law Concerning the Settlement of Environmental Pollution Disputes, the company presented their case to the council and in so doing denied any responsibility for environmental damage, arguing as follows:

1. As the largest of its kind in Japan, the Ashio Copper Mine took a leading role in generating the impetus for national economic development. During the Sino-Japanese War, the Russo-Japanese War, and World War II as well as during the reconstruction period after the war, the company responded to government orders and increased copper production.
2. In 1890 when the Watarase River was flooded, the mining company spent a great deal of money for pollution equipment that would

protect the environment. The company has already spent a great deal of effort to protect the water and air from pollution.

3. The mining company has maintained the specified water-quality standard of 0.06 ppm or less at the Takatsudo measuring point. Therefore, the river has not been seriously polluted.
4. Therefore, it is most debatable whether the real cause of the decline in agricultural production was caused by operations at the mine.
5. The floods are caused by the steep land formations surrounding the Watarase River basin.
6. If the operation of the Ashio Copper Mine could damage agricultural production in the area, then that same production could be damaged also by natural causes. In the past, the company has compensated the farmers in the area, and it is therefore not necessary to make compensation payments again.[9]

The Furukawa corporate position was based on an attitude of co-operation with national policy and on the previously determined water-quality standards. Therefore, it was argued that the company was not responsible for damage to the agricultural systems in the area. Especially in connection with item 6, Furukawa indicated that (a) agricultural damage had been less in the Morita area and (b) in December 1953, the company concluded negotiations by contributing ¥8 million for the improvement of the Machiyaba Irrigation System — witnessed by the Gunma prefectural governor and three members of the House of Representatives from the area in question. As part of the negotiated understanding at the time it was mutually understood that no further claims for damage relative to copper poisonings would be brought against the company. Further, according to section 115 of the mining laws, the statute of limitations for damage claims is three years. Therefore, the company rejected all claims that they were obligated to pay for damage. With this the Morita Association's resolve to resist was strengthened.

On 19 May, the Morita Association presented a second case for compensation on behalf of 842 people amounting to ¥3,232,270,000; this

represented a protest against the company's deceptive practices. Then on 31 August, a third case for compensation on behalf of 18 people was presented with the amount for arbitration being ¥45,030,000. Later the first and second cases were revised upward in amount bringing the total amount of compensation asked to ¥3,901,384,500 for 973 people living on 470 hectares of seriously damaged land. The first claims arbitration took place on 20 May 1972, and six such arbitrations were held that year. On 1 July the Central Council for Control of Environmental Pollution was changed into the Environmental Dispute Co-ordination Commission, starting the work of handling arbitrations. From 1972 to 1973 and on to the advent of the first energy crisis, citizens' movements against environmental destruction grew nationwide. The Government was forced to deal with the situation and began to revise various of the regulations concerning environmental problems. In June 1972 the Nature Conservation Law was promulgated, and in October 1973 the Pollution Health Damage Compensation Law came into being. When arbitration was taken up again, environmental pollution policies were completely reconsidered, and the newly formed committee handled the cases as its first task. All conditions came to favour the victims of pollution. In 1972 members of the Pollution Adjustment Committee went to the actual areas where so much damage had been done, taking samples and making observations on several occasions. Further, backing up the claims of the farmers, the surveys made proved that the areas in question were polluted by heavy metals such as copper and arsenic and that these pollutants had intruded upon the land from the slag piles of the Ashio Copper Mine.

On 1 November 1972, the company suddenly announced that it was closing the mine, and notification was sent to the labour union that there would be a reduction in the number of workers.[10] The reasons given by the company for the closing were reductions in copper ore and worsening of mining conditions. But this was exactly the time when arbitration was taking place relative to the claims brought by the Morita Association for Halting Copper Mine Poisonings. Thus it is difficult to say that there was no relationship between the claims being arbitrated and the closing of the mine. It is most probable that the

Furukawa Company's Ashio Copper Mine was closed in order to escape rising public criticism.

However, it was only the mine proper that was being closed, while the refinery would continue to operate with imported ores. This then made no real difference in the pollution released into the natural eco-system for it was the wastes from the refinery that polluted the Watarase River system. Even though the mine itself would be closed, there were continual running springs of water in the area of the mine, and in order to prevent pollution, this water would have to be treated even after the closing. Otherwise, without this precaution, the effects on the lower reaches of the Watarase River would be just the same as if the mine were open. Further, the size of the slag piles that had accumulated over 100 years of operation would continue to increase as long as the refinery continued in operation. Table 3 indicates the slag piles around the Ashio Copper Mine as of 1972. Thirteen of the slag piles were not in use; one still remained in operation. In 1972, according to company figures, the total volume of the slag piles was 11 million cubic metres of wastes. Table 3 indicates that a number of ravines in the Ashio area were also filled with slag. Unless appropriate measures were taken relative to the poisons in the piles, these materials would also end up in the river system.

At the present time the problems of slag pile disintegration and continual intrusion into the river system of untreated water have not been solved. Thus the company announcement that the mine was being closed came on the heels of the ¥3 billion compensation arbitration for agricultural damage to Morita area farm lands and the upheaval in pollution-related social awareness in the 1970s.

Table 4 indicates copper production at the Ashio mine from 1960. Every year the total production was about 5,000 tons until the year before the company announced that it was closing the mine. Production decreases can be seen in 1972 in preparation for mine closing. Along with the continuing economic growth being experienced by the nation, there was an increase in copper production that was based on imported ores. It

TABLE 3. Ashio Copper Mine Slag Piles (as of 18 May 1972)

Name	Slag pile opening date	Slag pile closing date	Slag pile land area (m^2)	Slag pile volume (m^3) (as of 30 April 1972)
Matsuki	October 1912	October 1960	208,000	1,938,150
Kobaragi	January 1901	April 1960	66,871	1,300,000
Arikoshizawa	January 1912	January 1953	123,000	1,822,214
Tenguzawa	October 1937	December 1959	112,550	848,136
Hara	June 1917	January 1960	281,543	1,583,528
Gengorozawa	October 1943	December 1959	7,263	161,995
Hinoki Daira	December 1943	December 1959	3,330	30,506
Utsuno	May 1897	December 1959	7,700	6,765
Kodaki	March 1959	December 1959	11,790	10,889
Hatao	November 1958	December 1959	9,430	13,726
Kyokonai	May 1897	March 1935	9,900	180,000
Fukazawa	December 1914	May 1925	27,000	101,444
Sunahata	May 1953	December 1959	11,817	59,670
Total			880,194	8,057,023
Sunokobashi	February 1960	In operation	218,000	3,242,000

Source: Kankyo Hakai, vol. 5, no. 9, October 1974, p. 34.

Note: Sources provided by Furukawa.

seems that increases in refinery output are related to the cadmium contamination in the Morita area. Four months after the public announcement, the mine was closed in February 1973. In March of the same year, the Besshi Copper Mine in Ehime Prefecture,[11] which had been in competition with the Ashio Copper Mine since the beginning of the seventeenth century, was also closed. However, in this case also, the refining activities have continued at the new Toyo Refinery using imported ores. Both copper mines produced a great deal of copper and played important roles in Japan's early modernization processes by exporting the refined metal. At the same time, the copper mining poisons and the smoke caused a great deal of damage to both farmers and fishermen. At the end of Japan's high economic growth period, both mines were closed along with other copper mines except for the Kozaka Copper Mine. This is a very interesting facet in the development of Japan's capitalism.

TABLE 4. Ashio Copper Production after the High Production Period (unit: tons)

Year	Ashio copper	Imported copper	Total	Ratio of Ashio copper (percentage)
1961	5,317	15,722	21,039	25.3
1962	4,955	14,296	19,251	25.7
1963	6,113	22,775	28,888	21.2
1964	5,367	23,753	29,120	18.4
1965	5,733	21,884	27,617	20.8
1966	5,868	23,197	29,065	20.2
1967	5,510	37,485	32,995	16.7
1968	4,328	29,431	33,759	12.8
1969	5,084	30,120	35,204	14.4
1970	5,141	30,541	35,682	14.4
1971	4,594	26,755	31,349	14.7
1972	2,974	26,321	29,295	10.2
1973	105	32,055	32,160	0.3
1974	158	29,542	29,700	0.5
1975	69	30,722	30,791	0.2
1976	60	32,827	32,887	0.2
1977	46	34,670	34,716	0.1

Source: A Local History of Ashio, 1978, p. 174.

The arbitration as to poisoning claims continued from 1972 to 1973. On 8 August, the Sabo Dam, known as the Sansen ("Three-River") Dam, located on the upper reaches of the river system near the refinery, collapsed and washed down 2,000 tons of soil. The emergency was sounded in Kiryu City and for other water departments that use the Watarase River. In October, the Environmental Agency announced the findings of a survey which indicated that the flooding induced by the dam emergency did in fact wash a great deal of poisons from the slag piles into the river system, and the worst fears of the people living within the areas served by the waterway were supported by the report.

The tenth arbitration session was held in June 1973, and afterwards specifics of the discussions were revealed. On 10 May 1974, the thirteenth arbitration session was held and the Environmental Dispute Co-ordination Commission formally revealed their findings to both the Morita Association for Halting Copper Mine Poisoning and the Furukawa

Mining Company. Since both parties to the negotiations had been told of the conclusions ahead of time, the papers of arbitration were signed on 11 May concluding the round of compensation demands made by the victims. There were nine articles of arbitration, including the following items: (1) Furukawa must admit that it caused damage to agricultural products and pay ¥1.55 billion in damages; (2) Furukawa must improve its anti-pollution measures at the mine so that heavy metals are not introduced into the Watarase River system; (3) Furukawa and the Morita Association should co-operate with related organizations to improve the land under laws designed to prevent farmland contamination in the Watarase River basin; and (4) in order to prevent further pollution problems, Furukawa must negotiate pollution prevention measures with Ohta City in Gunma Prefecture.[12]

The farmers requested compensation in the amount of ¥3.9 billion, and the amount negotiated was ¥1.5 billion. This indicates that the farmers did not win this case in the financial sense, but it was an epoch-making event in the century-old Ashio Copper Mine poisoning case, for Furukawa was required to admit their responsibility as the source of the pollution and was required to pay compensations instead of "providing funds to promote farming" or "making contributions." However, in the total compensation picture there were also a number of problems. In the first place, as many people indicated, the arbitration process was carried out behind closed doors.[13] Since this arbitration process was not open, it was difficult to learn some important lessons from this case that would have a bearing on other cases. In the second place, while not directly relevant to the arbitration process, the money paid in compensation was distributed among the individual farmers and not retained for the common funding of association activities. It would have been wise for the movement to use these funds to build further solidarity among the farmers, to continue the movement against copper poisons, and to set up a watchdog system to keep an eye on the further activities of the mining interests. The funds paid in compensation could have met these purposes. This problem must be understood as one of the limitations retained by the farmers who took their compensation demands for arbitration. The Pollution Adjustment Committee

had never before allowed the payment of such a large sum of money. The reason for this may be that the compensation was considered to small by the victims and too large by the company, resulting in strong pressure on the Environment Agency from economic circles.

III. THE OLD YANAKA VILLAGE SITE AND THE DIFFICULT TASK OF REFORESTATION IN THE ASHIO AREA

During the Russo-Japan War in which the entire nation was involved in the effort, Yanaka Village was completely damaged by the poison-laden floods and finally destroyed by the unrelenting power of the state. The Yanaka Village site was converted into a flood water retention basin for both the Tone and Watarase rivers. The site of Yanaka Village was changed for purposes of reconstruction and diversion of the river flood waters (see figure 2). After the demolition of Yanaka Village, flood water diversion construction for the Tone River was begun in 1909 and for the Watarase River in 1910. When the work on the flood water retention basin was included, these construction projects were the largest that Japan had undertaken in the period before World War II. The amount of sand and soil used in the project totalled 220 million cubic metres. This was more than in the Panama Canal project which required 180 million cubic metres of sand and soil.[14] In spite of the product of a project on a large scale, the retention basin proved useless against the power of nature. Every flood that converged on the area overran the banks of the control system. By repeated flooding the Yanaka Village site was innundated with soil and sediment carried from the upper reaches of the river. The intended function of the basin was not fulfilled. In 1947 Typhoon Katherine caused inordinate flooding that rendered the control basin ineffective. Flood water control construction for the Tone River was first instituted in 1896, with revisions being made in 1910 and 1935. After the typhoon, a complete remodelling of the system was required.

In 1935 after reconstruction from the flood, the flood water retention basin was recognized to be important as a flood control area. In 1947, when another flood took place, the function of the area for flood

(a) Yanaka Village Area before Reservoir Construction

(b) Present Situation in the Area

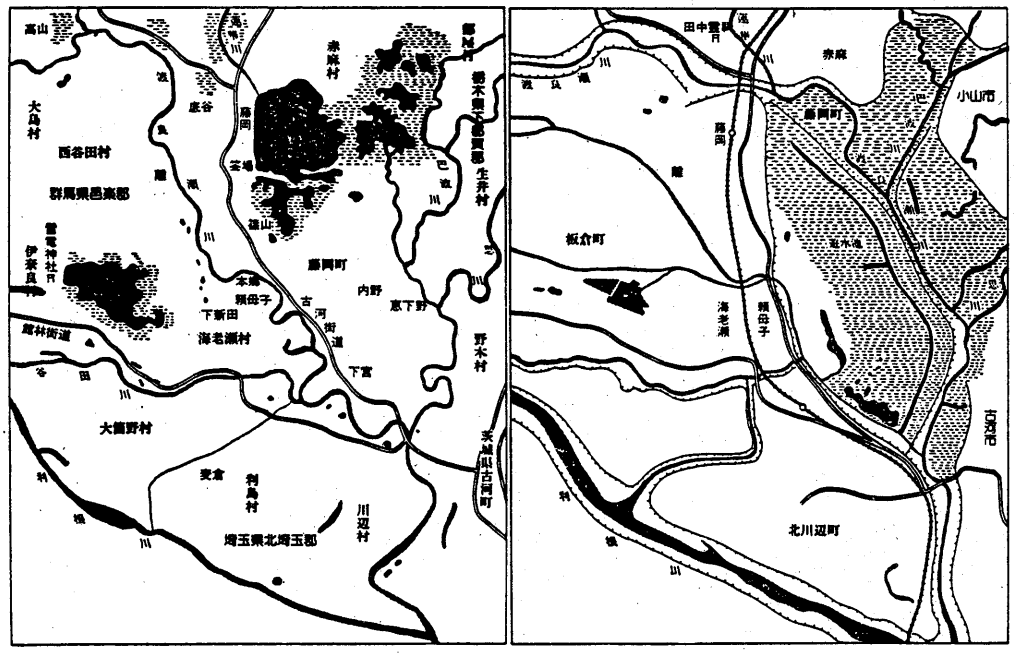

FIG. 2. A Comparison of the Old and New Watarase Flood-Control Reservoirs

Source: Shuichi Sae, Kozui o Ayumu — Tanaka Shozo no Genzai [Walking in the flood areas: Shozo Tanaka's world], Asahi Shinbunsha, 1980, pp. 24-25.

Note: Map (a) by the Japan Imerpial Land Surveying Department, 1909; Map (b) by Kokudo Chiriin, 1972

control was even more appreciated. In 1963, with a budget of ¥31 billion, actualization of a flood control programme was begun. The inflationary economy forced repeated revisions of the budget for the project. According to figures announced by the Ministry of Construction in May 1980, the seventeen years between 1963 and 1979 saw project expenditures of ¥20.98 billion. The 1980 budget included another ¥44.452 billion for this particular construction project. In other words, the total amount of money spent on the flood control project centred on the Yanaka Village flood water retention basin was ¥65.432 billion, or double the original estimated amount.

The flood control basin is composed of three sections with a total area

of 22.8 square kilometres containing 61.8 million cubic metres of water. The total length of the banks is 15,350 metres with the flood water control levies extending 3,181 metres.[15]

A few years after construction of the flood control facility, the idea of using the area as a reservoir was proposed. In January 1970 the Ministry of Construction announced plans for a water reservoir as part of a "New Plan for National Development." The purpose was to provide a water recreation area for metropolitan Tokyo while providing plenty of water for industrial uses. The plan called for digging to a depth of 6.5 metres over a 4.5 square kilometre area in the southern portion so that 26.4 million cubic metres of water could be stored. In 1970 preparatory surveys were carried out with actual surveys slated for completion in 1973. The Ministry of Construction started to build a road for construction purposes in 1976. Actual earth removal started in 1978 with completion slated for 1984. At the present time large dump trucks and other construction machinery occupy the area. The total budget for this project is ¥48 billion.

The reservoir is heart-shaped (see figure 3) with the remains of Yanaka Village with Enmei-in Temple and graveyard in the upper areas of the facility. In the summer of 1972, when construction started, the descendants of the Yanaka villagers held a sit-in demonstration in order to protect the graveyard from destruction by bulldozers. Some of the descendants of the Yanaka villagers, being forced to leave inherited lands at a nominal fee paid by the Government, stayed on weaving marshreed screens for sale in Tokyo. For three generations winters were passed by employing marshreed to make various items for sale. These same persons, who resisted government power, remained in the ruins of old Yanaka Village for more than ten years constantly stressing the need to rebuild. The descendants of the villagers as well as supporters of Shozo Tanaka's will and work formed a group named "For the Protection of Yanaka Village Ruins." The group continued tenaciously to negotiate with the Ministry of Construction and at last was able to save Enmei-in Temple and the graveyard area from inundation in the reservoir.

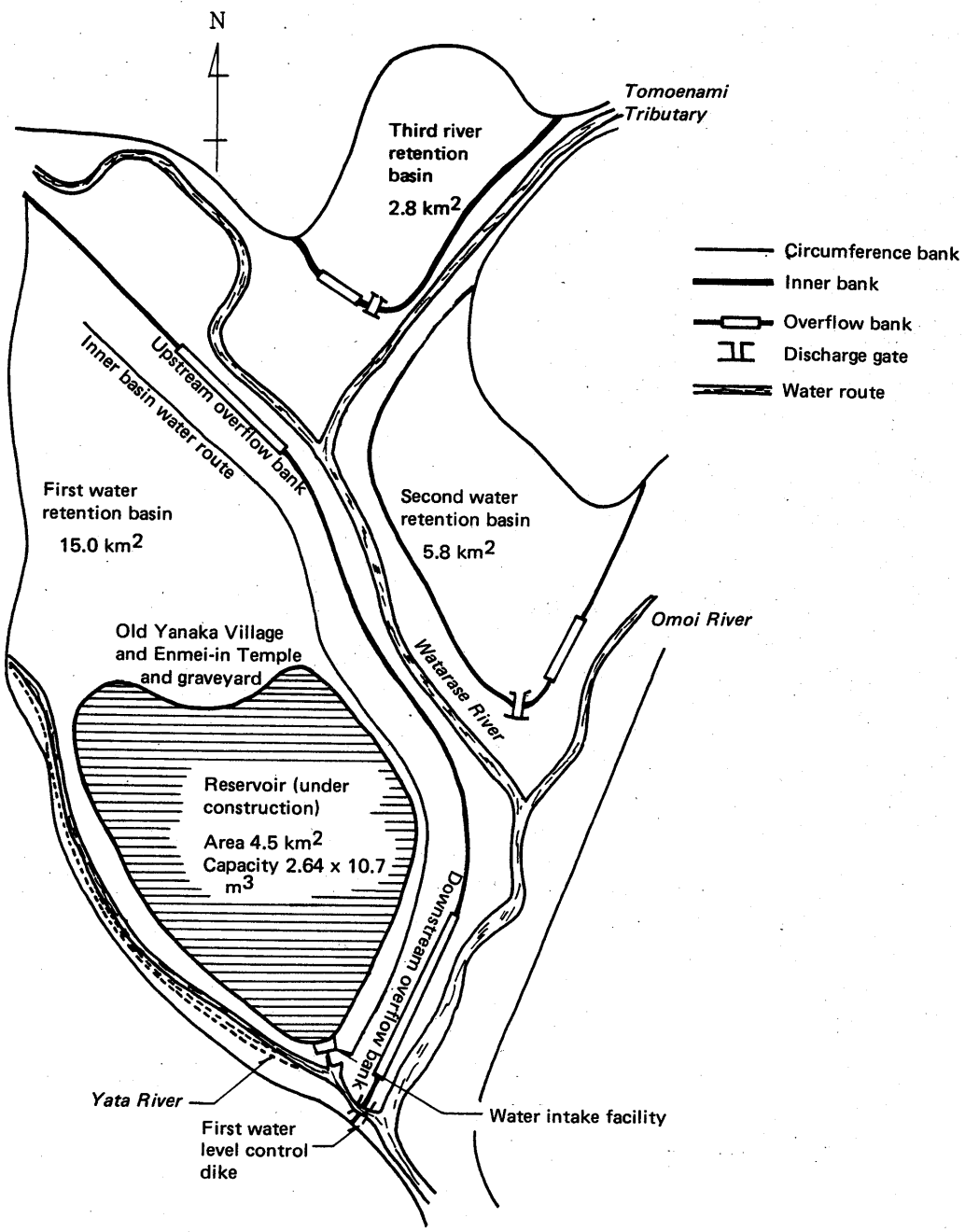

FIG. 3. Present Watarase River Reservoir

Source: "Watarase Yuusuichi Sogo Kaihatsu Jigyo no Gaiyo" [Outline of the Watarase River Reservoir Development Project] Tone River Upper Reaches Development Office, Kanto Construction Bureau, Construction Ministry, and "A Report on the Agricultural Uses of the Watarase River Reservoir Construction Area" by the Special Committee on the Watarase River Reservoir Land Uses, 1979, p. 3.

Why was it necessary for the ruins of Yanaka Village to be repeatedly dug up? The area is covered with sand and soil carried in by many floods, while the contour of the land has been changed many times as a result of the construction work. The receptacle area for the flood waters retains the natural scenery of the Kanto area. The area was very valuable since it encouraged the growth of various types of wet land vegetation, but because of the construction projects, the fields have been covered with reservoir water. Also the plateau is covered with waste solids from the reservoir construction projects. Looking over the large land areas one is reminded of the life-style of Yanaka Village. This area witnessed the demolition of Yanaka Village and the protest movements against the copper mine, which spawned the largest social movements seen during the later 1800s and early 1900s. At the same time the area is a reminder of the bankrupt policies of the Meiji Government which forced Japan's modernization at the expense of people's lives. At the present time, this area is an embarrasment to the Government as it intends to destroy what remains of the natural environment. Through the work of such environmental protection groups as the Yanaka Village Ruins Protection Organization and others, there has been an effort to save the village graveyard, but if this area is demolished by the bulldozers of the present Government as it emulates American capitalism in its search for higher GNPs, there will have been no progress made over the policies of the Meiji Government. The demand has been to preserve the land by bringing an immediate halt to further construction work, for the present conditions of the area remain a warning of the destruction that is wrought by a materialistic society, in order to preserve the ruined Yanaka Village as an observable fact of history and to save the animals and plant species there. Other proposed uses of the area are for such things as a site for both Japan and United States military manoeuvres, as a site for a new Tokyo International Airport, and as a site for recreation and tourism promotion organizations. The plan to use the area as a military reservation was quickly withdrawn since there were strong protests from the local Government and progressive groups.[16] What has been learned from this experience is that continued protection of the Watarase River flood plain depends on awakening the consciousness of people in neighbouring areas.

No matter how much dredging is done, such activity is meaningless as long as the silt brought by the flooding from the upper reaches of the river system is not stopped. Farming in the upper reaches of the river system came to a halt long ago so that the damage from the copper poisoning is no longer a social problem, but the constant flooding and related accumulation of silt and soil is a continuing problem for the flood control facilities. Because of these factors, it is necessary to continue monitoring the upper reaches of the Watarase River system.

The Morita area of Ohta City was polluted in the worst possible way from 30 kilometres above the location of the Kusaki Dam. This multiple purpose dam functions as a flood control facility, besides providing service and irrigation water plus 20,000 kilowatts of electrical power generation. The dam was started in 1971 and completed in 1976 at a cost of ¥31.5 billion. The height of the dam wall proper is 405 metres at its highest point, and the reservoir area is 17 square kilometres containing 50.5 million tons of water. This is a medium range facility without any special distinguishing features. But the one thing that distinguishes this reservoir from others is the fact that poisons from the Ashio Copper Mine are continuously flowing into its accumulation of water in spite of the fact that the mine is no longer in operation. This fact has been confirmed by the Environmental Protection Agency. In order to protect the facility from the intrusion of soil and silt containing heavy metal poisons, a roller gate system was used. The dam gate is provided with many rounded steps that slow the moving water so that relatively large amounts of soil and silt are precipitated at the bottom of the dam spillway. However, not all of the heavy metal poisons are retained; on the contrary, they are spread around more than they would be otherwise. Farmers in Morita Village are fully aware that the river water for irrigation contains much more suspended matter than it did before the dam was in place. Although the water examiners for the dam have paid careful attention to the reservoir, no solutions have been found for the clouded conditions of the irrigation water.

Although the reasons publicly given for the construction of the Kusaki Dam were related to water supply to Tokyo and flood control, there must

have been a more important hidden reason, for it can be surmised that the dam was actually meant to be a settling reservoir, just like the Watarase flood-control reservoir, for the poisons from the Ashio Copper Mine. This hidden purpose of the dam — so apparent to poison-affected people living in the lower reaches of the Watarase River System — can be inferred from a few pieces of circumstantial evidence. For one thing, when the Water Quality Inquiry Commission adopted, for the Watarase River, the meaningless water-quality standards based on average poison contents rather than maximums, the decision was obviously in anticipation of the construction of the dam. For another, when the Environmental Dispute Co-ordination Commission determined the compensation for poison victim farmers at an exceptionally large sum of ¥1.55 billion, there was the expectation that the dam would reduce damage and lessen the possibility of floods.

The pollution prevention agreements were completed in July 1976 when the dam was completed, and at the same time the agreement between Furukawa and the farmers was concluded. In March 1978, Specific Pollution Prevention Agreements were also concluded. However, the Morita Association for Halting Copper Mine Poisoning was strongly opposed to the provision of the agreements. The reasons for this opposition were: (1) the agreements were drawn up without the participation of victim farmers in the Morita area; (2) it was determined that the victims would not have the right to make their own water-quality surveys; (3) the Furukawa water-quality surveys would be definitive; (4) there was no specific plan for the improvement of the damaged land; and (5) although the Agriculture, Forestry, and Fisheries Bureau determined safe copper content water quality levels to be 0.02 ppm, the agreements called for a safety standard of 0.06 ppm.[17] In spite of the objection voiced by the people of Ohta and Kiryu cities, the mayors of these municipalities concluded the agreements. Even though it was time for land improvement to be undertaken, full support of the farmers was not realized because the Pollution Prevention Agreements were concluded without any voices from the people being heard. The slag piles in the ravines of the upper reaches of the Watarase River system continue to load the waters with poisons while

the Kusaki Dam was not effective in precipitating out the poison-ladened residues. In these circumstances it is expected that the situation will revert to the same difficulties that existed twenty years ago even with added land improvement efforts. It became clear that the land improvement efforts made available through the expenditure of ¥10 billion to be provided by Furukawa enterprises and the Government would be ineffective unless adequate steps for preventing further poison intrusions were taken. Further, the farmers thought that land improvement under the present laws required that the land be used only for farming. But there being no guarantee that the land will remain free of poisons, the farmers remain under the constant threat of further damage.[18] The contaminated land cannot be left alone. Appropriate measures should be instituted and the improvement of the land should be carried out through the provision of adequate amounts of cost free organic fertilizers. It is essential that the Furukawa interests assume complete responsibility for improvement of the land until such a time when forests are again found flourishing in the areas surrounding the Ashio Copper Mine.

Although the Pollution Prevention Agreements were concluded, the copper and arsenic contents of the river system were very much above the standards when heavy rains came.[19] This was a factor in environmental degradation when on 18 October 1979 the area was hit by a typhoon. In this case water containing copper-related poisons overwhelmed the banks of the Nakasai settlement bed and poured into the Watarase River system. The deficiencies that were very apparent with the settlement beds and the slag piles had been objects of protest by the farmers and their Association for Halting Copper Mine Poisons.

The mountains around the Ashio Copper Mine Refinery on the northern slopes are still very nude and devoid of life. This is a typical situation which illustrates the difficulty of restoring nature once it has been destroyed. To the south of the refinery, very costly measures were used to try to restore life to the denuded mountains, and around this portion of the river system some restoration of nature is to be seen. However, the northern areas still show no signs of regaining a

viable growth of vegetation. In this situation, protection against falling rocks and erosion prevention has to be maintained with the erection of special reinforced concrete walls and buttresses. Even in some of the small ravines a number of protection dams were built to contain the water. But very soon, these dams were filled with fallen rocks. Workers from the Regional Forestry Offices transported soil up to the dam areas in order to plant grass and trees. These efforts are slowly restoring greenery to these areas that had been so completely damaged by the smoke from the refinery.

Unfortunately, mountains on the northern areas of the refinery are very steep and the erosion is much worse. In this area it was impossible to build even a small dam. It is impossible in areas like Matsukizawa and Nitta Genzawa where the damage is very severe. For the last few years reforestation of Kuzozawa Suji has been progressing but it will take another ten years before nature is restored to these areas. Reforestation of the most severely destroyed areas such as Matsukizawa and Nitta Motozawa may take several hundred years. Matsukizawa was a deeply forested area before Furukawa started the copper mine. The degree of reforestation was much the same as that seen in the Nikko Chuzenji Lake area today. But in Matsukizawa there is not a tree to be seen. There is only a little grass growing in areas where rocks have accumulated on the gentle slopes of the area where the Matsuki villagers once lived. It is ironic to see deeply denuded desert conditions in an area of the Kanto Plain that is famous for its rainfall. The workers hired by the Regional Forestry Offices spread seeds imported from the United States on the rocks from helicopters and also tried to paste seed and fertilizer mixtures to the nude mountain slopes. Little by little the effects of these efforts can be seen.

After World War II the costs of reforestation in the areas around the refinery came to about ¥3.3 billion, but at current valuations this is equivalent to ¥7 billion yen. Before the war the total amount of money spent for reforestation was ¥690,000 which is equal to about ¥2.1 billion today.[20] This means that the Government has spent more than ¥10 billion for reforestation in this area. Further, the 1977

plans call for an expenditure of about ¥130 billion for reforestation projects in the areas around the copper mine. Even with these massive amounts of money being spent, nature is a long way from being restored.

The cause of this desertification in a national forest was the sulphurous anhydride from the Ashio Copper Mine refinery. But the costs for restoring nature in the area have been borne by the national coffers. In all of this no one had ever questioned Furukawa's responsibility for the extreme damage to the national forests, nor has there ever been any challenge in the courts demanding reparations for the damage done. The Government, which supervises national property, should have demanded reparations from the Furukawa enterprises, and this compensation should have been used to restore the extreme damage to the area done by the refinery effluents. The Government made no effort to gain such funds from Furukawa, and in 1960 the Government renounced its right to seek reparations.[21] This is another indication of the neglect that is rampant in the administration and the manner in which government and business are amalgamated. This renunciation of the right to seek reparations was actually instituted by the Forestry Agency which is responsible for administering the national forests, and this action took place at a time when the farmers in the area were questioning with growing intensity the responsibility of Furukawa in the case of the collapse of the Gengorosawa slag pile. However, neither the farmers nor environmental researchers had any knowledge of this renounciation of the right to reparations by the Forestry Agency. When the copper poisonings became an issue again, the Government did not make this fact known. The Forestry Agency sent notice to the forestry management section chief relative to reparations for damage to national forests by refinery smoke. The reparations were to be for damage in 1957, 1958, and 1959. This notice did not include reparations for the years previous to 1956, for the mining law, article 115,[22] states a limitation on reparations for a three-year period, and the many years before 1956 had come to be non-negotiable because of the statutes of limitation. This is the same as indicating that no questions were raised as to responsibility for denuding the Ashio National Forests. In June 1960, the Ministry of Agriculture and

Forestry determined the method in which damages would be calculated,[23] this taking place a full year after the notice on forestry damage had been sent, and this method was actually applied to the case in question. The calculation was to be based on a reparations formula that would determine damages only after consulting the copper company. Following the order, Furukawa paid a solatium in the amount of ¥3.2 million, and this ended the issue of extreme damage to a very wide ranging area of the national forests.

In 1956, the Furukawa mining interests imported a new type furnace from a company in Finland which used the smelting hearth refining method, and with this, the contact method of sulphuric acid production was imported from the Monsanto Chemical Company of the USA, which provided concentrated sulphuric acid from sulphurous anhydride. In this way, the sulphurous anhydride which had been discharged into the air was to be recovered. Table 5 indicates the production of concentrated sulphuric acid from the new Furukawa installation. From this table, it becomes clear how much sulphurous anhydride was in the air before the installation was introduced. But the Forestry Agency requested reparations for damage only after there was a significant decrease in the amount of sulphurous anhydride from the refinery. In this situation,

TABLE 5. Concentrated Sulphuric Acid Production (unit: tons)

Year	Production	Year	Production
1956	41,420	1967	101,134
1957	50,192	1968	101,962
1958	51,328	1969	95,826
1959	61,913	1970	94,262
1960	58,876	1971	87,499
1961	63,150	1972	91,476
1962	68,095	1973	89,641
1963	89,842	1974	88,007
1964	97,790	1975	84,968
1965	85,612	1976	87,766
1966	85,308	1977	95,524

Source: Ashio Kyodoshi, p. 178.

it becomes very clear that public property was managed in a very careless manner. When these requests for reparations were made, as can be seen in table 6, there was not a single tree in the Ashio National Forest. The total area that was completely denuded at that juncture was more than 2,000 hectares. If privately owned mountainous areas were to be included (owned mostly by the Furukawa family) the denuded areas would be equivalent to 3,000 hectares. The area that is severely damaged comes to 1,200 hectares. In spite of this extreme damage to a national forest system, the compensation actually paid by the Furukawa Mining Company was a mere ¥3.2 million, and the agreement was concluded before there was any public knowledge of the issues involved. As Kanson Arahata said, the Ashio Copper Mine poisoning incident is a sin perpetrated by the Government in collusion with capitalist interests.

Even though a new installation was applied to the purposes of sulphuric acid production, the presence of sulphurous anhydride in the smoke from the refinery chimneys was to be detected for the ensuing ten years because the technology was imperfect and the demand for sulphuric acid decreased over the years. Every year the Ministry of Agriculture and

TABLE 6. Smoke Damage as of 1955 (unit: hectares)

	Maebashi forestry resources			Tochigi Prefecture resources
	National preserves	Private preserves	Total	Total
Denuded land	2,095	883	2,978	2,598
Severe damage	1,198	218	1,416	4,618
Moderate damage	2,259	644	2,900	8,085
Slight damage	7,533	444	7,977	15,577
Total	13,082	2,189	15,271	30,878

Source: Heima Suzuki, "Basic Research on Reforestation of the Denuded Mountains around the Ashio Copper Mine — A Short History of Refinery Related Smoke Damage," Utsunomiya University Academic Report, Gakujutsu Hokoku, vol. 6, no. 3, March 1967, pp. 35 and 56.

Note: Research by Masujiro Kurato and Akira Hashimoto.

Forestry would accumulate figures on the extent of the accumulated damage done but would not ask reparations from the Furukawa Mining Company having much the same intention as was seen with the Notification in 1960. In this manner Furukawa was exempted from damages on the basis of the three-year statute of limitations.

The Ashio town officials have named the Ashio area Japan's Grand Canyon in an attempt to increase sightseeing in the area. The basic cause of the floods in the lower reaches of the Watarase River system is the denuding of the mountains in the upper reaches. In order to overcome the population decrease seen in the area due to the mine's closing, public officials have stressed the unique character of the denuded mountains instead of encouraging forestry cultivation. What the administration must do now is restore the forests by insuring that Furukawa provides methods to halt the leakage of poisons into the river system from the slag piles. As an immediate measure, the administration should underwrite the work, after obtaining full recognition of the culpability of Furukawa in relation to the great damage already done. The basic policy should be reforestation, not advocation of the denuded and unnatural state.

CONCLUSIONS — REVIVING THE PHILOSOPHY OF SHOZO TANAKA

Ninety years have passed since the Ashio Copper Mine first became an important social issue. More than 3,000 hectares in the upper reaches of the Watarase River system and another 3,000 hectares in the lower reaches where the Watarase and Tone rivers meet are still considered to be in desolate desert conditions. Simply by surveying this very extensive damage it is possible to imagine the degree to which the copper poisons and smoke were inimical to health and life. This severe destruction of a wide ranging environmental system was the result of Japan's development in the nineteenth century when there was very great eagerness to attain the technological sophistication of the West in the context of national aggrandisement as seen in such slogans as "Fukoku Kyohei" (enrichment of the nation through militarization) and "Shokusan Kohgyo" (promotion of industrialization). There is extreme awareness of the deep problems which arose through this methodology as Japan developed modern technology through the promotion of material wealth.

The first priority of Japan's ruling classes was to catch up with the advanced nations of the West and to promote production through the development of modern technology. There were many who had been in poverty for long enough to seek escape from its grip by co-operating with this ideology of the ruling classes. This social milieu in which production was the primary goal, came to be more seriously scrutinized in the early 1970s when popular anti-pollution movements were in their ascendancy. However, bureaucrats, corporate managers, and labour unions still emphasize production as the primary national goal.

In evaluating the civilization of the machine, Shozo Tanaka once said that "People in this world are chewed up two times and killed three

times by machinery dominated civilization."[24] Thus he constantly stood in criticism of so-called modern civilization. He also predicted the present atomic age through which the destruction of all life on the face of the planet is possible. Not only the creation and existence of atomic and hydrogen bombs, but the manipulation of the genes of life and the presence of heavy metal and other poisons in the environment are all adding to the crisis in this age when "human beings are being chewed up." Tanaka was continuously pointing out the seriousness of the copper poisonings and the total lack of responsibility toward life on the part of capitalists, government officials, and bureaucrats. Tanaka understood fully that increasing production as a primary goal was what encouraged the copper poisonings through the support of an environment-destroying political system. But Tanaka did not necessarily completely negate modern civilization. He said,

> Barbarians perform barbarious acts. If barbarians employ the power of modern civilization and use civilized techniques, the resulting damage is incredibly severe. Therefore, the damage caused by barbarians is small when compared to the destruction of civilization.[25]

Furthermore, he said,

> With the material progress of human societies, there can be a universal retreat of darkness in society. Without electricity, it is dark. Therefore, materialistic progress should not be despised. With such development visible and invisible spiritual development may be possible. That is, material reality can have both wisdom and virtue. The culture of present Japan has quality but no character; there is wisdom but no virtue. Without repentance, there can only be destruction.[26]

In this manner, Tanaka criticized the present culture of omnipotent materialism. More and more, toward the end of his diary, criticism of modern civilization grew in intensity and frequency. Reading his words, written three quarters of a century earlier, we find deep and abiding criticisms of the overgrown material culture of our times.

Shozo Tanaka died in September of 1913, as he was on his way to further investigations of the river systems. The farmers called him the "river man" in his anti-copper mining stance, but toward the end of his life Tanaka was abandoned by the farmers. It took his death to bring the

farmers back to him for they all came to his funeral. It was the largest funeral for any single person in modern history. After the cremation, the remains were divided and interred in five locations, in honour of his memory. Such arrangements were not in Tanaka's will, but for those who had tired of the anti-copper mine poisoning movement, this was an important ceremony. Thirteen years after his death, the supporters of Tanaka, including farmers and intellectuals in Tokyo, published five volumes of Tanaka's speeches and letters under the title Gijin Zenshu [The complete works of a righteous man]. The biography of Tanaka and the history of the copper mine poisonings were produced in many different kinds of publications out of which have come more than ten books and twice that amount of material in many magazine articles. Tanaka continued the movement and struggle but died alone. After his death he entered the ranks of the righteous, becoming once again the leader of the people and an object of worship.

Since then, many years have passed and for most people Tanaka has become a legend. During the latter phase of the 1960s problems of environmental destruction erupted on a national scale. As these problems intensified, people began to learn again from Tanaka, this time not as a righteous man, but as a man of thought and action. He became a well-known personage among anti-pollution movement activists, history researchers, scholars of modern thought, and political analysts.

Another reason for the re-evaluation of Tanaka during this period was related to the organized activities of those who became supporters of the descendants of old Yanaka Village. The descendants and surrounding villagers put up a gravestone to Tanaka at the poisoned water retention basin, in witness to a hoped-for restoration of a self-governing village, which was one of Tanaka's aims during the latter years of his work and life. With a few supporters from Tokyo, the Tanaka Association was formed whose aim was the restoration of the Yanaka Village. When the farmers were forced to move out of the village, the tombstone was also moved. Even today, on 4 April, people come together to commemorate Tanaka's name. The present Tanaka Association is made up of third generation Yanaka villagers. When they talk about Tanaka, it

sounds as if he were still living among them as a person, not as the righteous man of public domain.

The descendants of Yanaka Village did not join in the other movements of farmers, on the upper and lower reaches of the Watarase River system, demanding compensation from the Ashio Copper Mining Company. With the occurrence of the "Kayakari Incident," after being forced to move out of Yanaka Village, the villagers sought to protect their right of use of the old Yanaka Village site.[27] Otherwise, the villagers were not joined together in any organization except that designated to commemorate the grave of Tanaka. In May 1957, members of the Tanaka Association along with other Tanaka supporters, rebuilt the shrine to Tanaka, and in December the organization was made a legal religious body. In Japan's modern history, Tanaka was the only person to be enshrined by the people as a "righteous man." Through these activities, the Tanaka Association began gradually to have influence on others. As a result a few historians also became interested in Tanaka's work.

The continuing work of the Tanaka Association came to be recognized and widely known during the nationwide anti-pollution movements of the latter 1960s. Thus, on the fourth of April, every year, more and more people have been coming from far away to celebrate at the shrine. There are some people who have suggested that the old Yanaka Village site be made the Mecca of human survival in an ever increasingly polluted world. Such a plan has historical merit in this regard. Many people visit the site and learn of the power of Tanaka's spirit in the struggle against environmental destruction. In this manner, Tanaka's lifelong work and determination relative to the anti-copper mine movement will be realized through the hoped-for restoration of Yanaka Village and the memory of his activities.

In March 1972, Tanaka's philosophy and actions were re-evaluated in relation to the history of the copper mine poisonings. At this time, twenty people belonging to six families that had immigrated to Hokkaido from Yanaka Village, returned after 60 years in Hokkaido.[28] The natural conditions in Hokkaido were so very severe that they wanted to

return to their home towns. But Tochigi prefectural officials ignored their plea. The first petition was sent to the prefecture in 1927, and a total of three petitions were sent before World War II, without any hope of realization. In April 1971, when pollution issues were the central problems of society as a whole, the fourth petition was sent to prefectural administrative officials. With this presentation, the petition was accepted but return to their homeland was impossible. Even with the desperate efforts of Tanaka and others wishing to return to their home soil, this dream has not been realized because the village does not exist anymore.

NOTES

1. Nihon Keiei-shi Kenkyusho, ed., Sogyo Hyakunen-shi — Furukawa Kogyo [The first 100 years of Furukawa enterprises], 1976, p. 601.

2. Shoichi Onda, "Ashio Dozan Kodoku o Megutte" [Ashio Copper Mine related damage and present conditions], Jurist, no. 492, Nov. 1971, p. 78.

3. Relative to the Honshu Pulp Company Edo River Factory incident (pulp wastes dumped into the river) see Yoshikazu Ishida, ed., Gyomin Tohsoshi Nenpyo [History of the fishermen's struggle], Akishobo, 1972, and Keiko Wakabayashi, "Umetate Chiiki ni Miru Kankyo Hakai to Gyomin Tohsoshi — Chibaken Urayasushi" [Land reclamation related environmental destruction and the fishermen's struggle], Kankyoho Kenkyu [Environmental law studies], vol. 2, Apr. 1975. The following is a brief explanation of the incident found in these references.

   The Edo River Factory of the Honshu Pulp Company began operation in 1922. On 19 March 1958, a new section was added for SCP (semi-chemical pulp) production. Operations were continued from 22 April. During the period of experimental operations, sludge was discharged from the installation into Tokyo Bay. Various life forms including clams and seaweed all died from the sludge intrusion. Eight fishermen's unions in Tokyo and Chiba demanded that the sludge and factory operations be stopped, but the company ignored the protests. On 24 May, a group of 1,000 led by fishermen from Urayasu City entered the factory and demanded that the sludge intrusion be stopped. The company stopped the sludge intrusion but in June sludge output into the bay was started again. The fishermen demonstrated in front of the Tokyo Metropolitan Government Headquarters demanding that the sludge intrusion be stopped. After holding a large gathering of people affected, on 10 June, they went again to appeal to the Tokyo Metropolitan Government and then entered the Edo River Factory of Honshu Pulp. After entering the factory, the fishermen were confronted by several hundred riot police and were beaten with police truncheons. There was much blood shed at the gates to the factory with 143 people injured and one person hurt critically. Eight persons were arrested. After this incident, government administrative personnel took over the operations of the Honshu Pulp Company. The company indicated that installation of a sludge treatment plant would require three months and asked to be allowed to discharge untreated sludge into the bay for a period of three months. In reality the installation

took only ten days but the SCP installation suspended operations until March 1959. The social impact of the Urayasu Incident was great indeed, especially for fishermen who were facing problems relative to reclaimed land and water pollution as they were brought into concerted action and unity. On 30 June, 4,000 representatives of fishermen's organizations nationwide gathered in Tokyo to hold a convention that would deal with water pollution prevention policies and appealed for regulatory laws to govern water pollution. Through these brave acts of the Urayasu fishermen, two water pollution regulation laws were passed in the Diet in December 1958. After negotiations were held, the company was required to pay damages to the fishermen amounting to ¥51 million, between December 1958 and February 1959. The 30 people who were prosecuted in the Urayasu Incident were freed. In this case the company had to pay a total of ¥170 million in damages and compensation, water treatment facilities had to be built, and ¥1 million per day was lost for eight months when the SCP installation was shut down. If the company had installed these treatment facilities from the beginning, there would have been no injuries among the fishermen, and the company would not have had to pay such large amounts in construction expenses. There would also have been no damage to the corporate image.

4. Shoichi Onda, "Suishitsu Kijun no Karakuri" [Mechanisms of water quality control], in Jun Ui, ed., Kogai Higaisha no Ronri [Contentions of pollution victims], Keiso Shobo, 1973, p. 11.

5. Onda, ibid., p. 18.

6. For information related to the Water Quality Council's indifference and the manner in which the government administration and Furukawa Copper Mining interests were in collusion when the standards were set at the expense of the farmers, refer to Eidai Hayashi, "Kodoku Konzetsu no Negai" [Seeking a halt to copper poisoning], Bohyko — Kohdoku wa Kiezu [Nostalgia — poisons never disappear], Aki Shobo, 1972.

7. Asahi Shinbun, 4 June 1970 and 9 Sep. 1970.

8. As a result of rapid economic growth, pollution damage was very heavy and costly. In the later stages of the 1960s there were many struggles between the victims of pollution and the economic organizations that caused the environmental damage. There were many cases where the lives of victims were threatened by the damage to the environment and where the confrontation between the victims and corporate management resulted in court battles. The four major court battles were the Niigata Minamata disease (brought to court in 1967), Yokkaichi Asthma case (brought in September 1967), the Ouch-Ouch disease case (brought in March 1968), and the Minamata disease (brought in June 1969). These court battles came to public attention in 1970. In 1970, air pollution caused by tetraethyl lead became a celebrated social issue. Day in and day out the mass media would touch on these issues. In December 1970 a special session of the Diet was held to pass laws related to environmental control issues. The pollution prevention laws promulgated in 1967 were also strengthened. In the improved

versions of the laws, the sections that dealt with "economic harmony" were struck out with the understanding that economic harmony was pursued at the expense of the environment and to the creation of more environmental disease victims. At the same time the leaders in economic circles did not agree with the striking out of these articles in the laws but the power of public opinion was much greater. From 1973, as a result of the so-called "oil shock" there has been a continual call for the reinstitution of the "economic harmony" articles in the laws.

In 1970 a total of 14 laws related to the environment were enacted or old laws were revised. These laws related to environmental management were enacted during the period when pollution damage was at its worst during the latter 1960s and early 1970s. The old water-quality laws were abolished as well as regulations for factory wastes and new laws instituted in their place relative to water quality. The major pollution struggles were dealt with in the civil courts. Victims did not take their cases to the new Environmental Disputes Councils for settlement, for these organizations were not trusted because of the long history of collusion between the government administration that set up the councils and the companies that were supposed to be controlled.

9. For the contents of Furukawa's Ikensho [Opinion], see Kankyo Hakai [Environmental destruction], vol. 5, no. 9, Oct. 1974, pp. 36-38.

10. Asahi Shinbun, 1 Nov. 1972.

11. The Besshi Copper Mine became the foundation of the Sumitomo Zaibatsu (giant family trust) operated by the Sumitomo Metal Mining Company, Ltd. For information on the smoke damage and copper poisons released from the Besshi Copper Mine, see Masuro Sugai, "Besshi Dozan Engai Jiken" [Besshi Copper Mine pollution case], Shakai Kagaku Kenkyu [Social science studies], vol. 29, no. 3, Oct. 1977, and Masuro Sugai, "Nihon Shihon Shugi no Kogai Mondai — Yondai Dozan Kohdoku Engai Jiken" [Pollution problems and Japanese capitalism — the four major copper mine pollution cases in Japan], Shakai Kagaku Kenkyu, vol. 30, nos. 4 and 6, Feb. and Mar. 1979.

12. For the contents of the arbitration, see Kankyo Hakai [Environmental pollution], vol. 5, no. 9, p. 21, and Asahi Shinbun, 10 May 1974 (evening edition).

13. Asahi Shinbun, 10 May 1974 (evening edition).

14. Hiroshi Koide, Nihon no Kasen Kenkyu [Research on the rivers of Japan], Univ. of Tokyo Press, 1972, p. 93.

15. "Watarase Yusuiichi Chosetsuchika Koji no Gaiyo" [Outline of the Construction of the Watarase Reservoir Retention Basins], pamphlet by the Tone River Development Office of the Kanto Area Construction Bureau, Ministry of Construction, published in Sep. 1974, Feb. 1976, and May 1980.

16. A plan for the use of the land for war games by the United States Army came to the related villages from the Procurement Agency in July 1962. One city, two towns, and three villages organized the

Association to Oppose the US Army War Games Plan. Their appeals were repeated, and demonstrations at the related government agencies caused the plan to be dropped. Progressive groups held a large rally in November 1962, in which 12,000 people participated, calling for a cancellation of the plan. Because of this opposition by the people, a plan for the US military use of the land for war games was cancelled.

17. Asahi Shinbun (Gunma Prefecture issue), 30 May 1978.

18. An interview with Shoichi Onda, 6 Jan. 1981.

19. Yomiuri Shinbun (Gunma Prefecture issue), 17 Nov. 1979.

20. Eirinsho Ohmama, Ashio no Chisan [Forestry conservation in the Ashio area], Ashio Chisan Jigyosho, 1978, p. 10.

21. "Hohkishita Kokuyurin Hosho" [Reparations of the abandoned national forests], Asahi Shinbun, 20 Oct. 1980 (evening edition).

22. Article 115 of the Copper Mining Reparations Act (Statute of Limitations). The right to claim damages from mining lapses unless reparations are asked for within a three-year period. After 20 years of damage from the same cause, this still holds. Progressive damage is calculated from the time that the damage comes to a halt.

23. For information on "Reparation Contracts" for damage to national forests from copper mine smoke, see Mutsuhiko Yasuda, "Ashio Kohdoku to Kokuyurin Higai" [Ashio Copper Mine damage in the national forests], Kogai Kenkyu [Pollution studies], vol. 11, no. 1, July 1981.

24. Tanaka Shozo Zenshu [The complete works of Shozo Tanaka], vol. 12, Iwanami Shoten, 1978, p. 426 (taken from Tanaka's diary dated 29 Aug. 1911). See also Kenneth Strong, Ox against the Storm: A Biography of Tanaka Shozo, Japan's Conservationist Pioneer. Tenderdent, Kent, Kenneth Norbury Pub., 1977.

25. Ibid., vol. 13, 31 Jan. 1912, p. 71.

26. Ibid., vol. 13, 21 Jan. 1912, p. 532.

27. The people who were required to leave Yanaka Village were given the right to use the land for cultivation and to grow reeds on the water retention areas. But in 1921, Fujioka Town tried to transfer this right for the use of this land to others in response to the Tochigi Prefecture Seiyu-kai power struggle. Because of this incident, the old Yanaka villagers and the people of Fujioka Town came into conflict. The Yanaka villagers called a large meeting of their supporters and protested the actions of Fujioka Town until their rights had been reinstated.

28. Regarding the life of the people who had to move to Hokkaido, refer to Yoshitaka Koike, Yanaka Kara Kita Hitotachi [The people from Yanaka], Shin-jinbutsu Ohraisha, 1972. For information on their return to Yanaka Village, refer to Eidai Hayashi, Bohkyo.